Piranha

&

QABrowser

User's Manual - English - Version 5.5A

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Table of Contents

1. Description of the Piranha 3
1.1 Indicators and Connectors 3
1.2 Setting Up the Piranha for the First Time 6
1.3 Setting Up the Piranha 6
1.4 Standards and Compliances 7
1.4.1 FCC Certification 7
1.5 Standards and Compliances 7

2. Description of the QABrowser 7
2.1 Starting the QABrowser 7
2.2 Real-time Display and Waveforms 8
2.2.1 Using the Real-Time Display 8
2.2.2 Waveforms - Acquiring and Viewing 12
2.2.3 Measurement Settings 13
2.2.3.1 Settings - Conditions 15
2.2.3.2 Settings - Piranha 18
2.2.3.3 Settings - Internal detector 20
2.2.3.4 Settings - Other Detectors 21
2.3 QABrowser Setup 22
2.3.1 Units Setup 22
2.3.2 Preferences Setup 22
2.4 Battery & Power Status 23
2.5 Indicators and Symbols 23

3. Problems and Solutions 24
3.1 Troubleshooting 24
Index 27

Note!

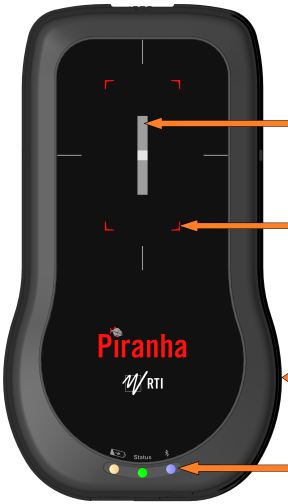
For a full description of the Piranha and the QABrowser, see the Piranha & QABrowser Reference Manual.
The Reference Manual can be found on the Product CD or be downloaded from RTI's website (www.rti.se). The manual is available both as PDF and Browser format. The Browser (HTML) format is recommended for easy searching.

1 Description of the Piranha

1.1 Indicators and Connectors

The Piranha comes in a lot of different models, the external design is basically the same for all models (except for the External Probe port).

Edge: External Probe port
(on some Piranha models)

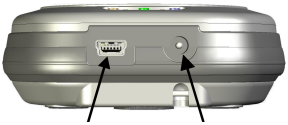


Detector area
The rectangular marking indicates where the active detector area is located. The detector surface is located 10 mm below the surface, see section Specifications, Piranha in the Reference Manual. Minimum X-ray field is 3×21 mm.

The recommended field size is shown as red corners. (20×40 mm).

Power switch (on edge)
Turns the Piranha on and off

Indicators for charging, status, and Bluetooth



USB port

Palm charger output (not used)

The **USB port** is used when using RTI Updater to update the internal firmware. It can also be used when the Piranha is used together with a PC running the QA software Ocean. Note that the USB connector cannot be used when connecting to a handheld computer. The system is then powered from the PC via the USB cable. The PC however have a limited USB power output, so when fast charging is needed the power supply needs to be connected here. This is also possible when using the Bluetooth link to communicate with the Palm or PC. The port is marked **USB**.

The orange indicator for **Charging of batteries** is lit when charging is active. Note that charging is possible even when the power switch is off.

The blue indicator for **Bluetooth** is lit when the Bluetooth interface is active and discoverable.

The multi-coloured indicator for **Status** shows the status of the system, e.g. battery level as described below. Also works as **Power indicator**, one of the colours will light when the Piranha is on.

Battery level

The status indicator is used to show the battery level of the Piranha.

1. Starting a system running on batteries the status indicates for 3 seconds:
   - Green if battery level over 25 % (4 h left)
   - Yellow if battery level between 10 and 25 % (1½-4 h left)
   - Red if battery level below 10 % (<1½ h left).

   The idea is to get a quick indication when powering on the system if it will take me through today's work.

2. When running on batteries the status indicator shows:

Status colour	Running time left
Green	>2 hours
Yellow	>1 hours
Red	>15 minutes
Flashing red	<15 minutes

Note! You may also check the battery level in the QABrowser, see section Power Status 23. For Ocean on the PC, please see the Ocean manual.

See section Power & Communication Specifications for more information about battery charging and discharging times.

External Probe port and **Opening for filter position viewing**

Here you attach the external probes that come with some models of the Piranha. The port is marked **EXT**. Note! Not all models have this port.
The small square opening above may be used for monitoring the filter position inside the Piranha.

Product marking
Indicates the model of you Piranha, as well as the version, serial number, and applicable conformity markings.

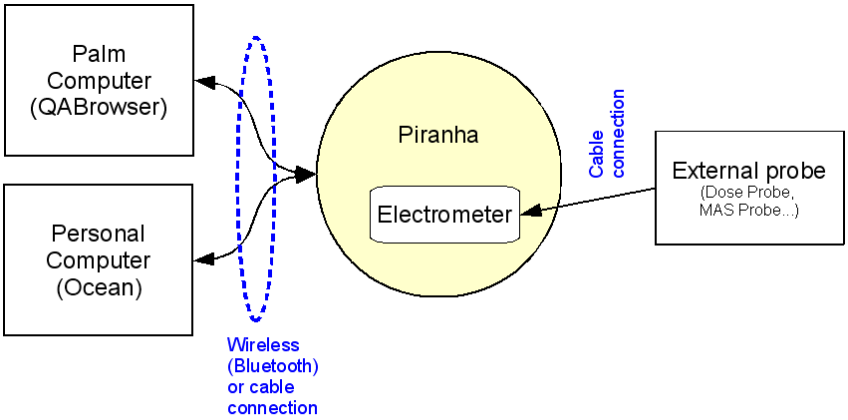
Power switch
Turns the Piranha on and off (Marked 1/0)

Camera thread for mounting the Piranha to a holder.

Attachment for **Safety strap**

The **Power switch** is used to turn the Piranha on and off. Piranha has several ways of saving power when it is inactive, but must be powered off manually since there is no auto-power off function.

Below a block diagram of a typical Piranha system is shown.



1.2 Setting Up the Piranha for the First Time

Before you use your Piranha for the first time, please do the following:

- Attach the external power supply.
- Charge the system for 16 hours.

Then continue according to the following section.

1.3 Setting Up the Piranha

To set up the Piranha:

1. Power on the Piranha using the power switch. Optionally you may connect the power supply.
2. Place the Piranha under the tube or mount the holder and HVL stand for positioning of the Piranha in the X-ray field. The stand allows you to position the Piranha (or the external Dose Probe) and HVL filters in any angle including upside-down. Use the light-field or other help to position the Piranha in the X-ray field. The Piranha detector is not sensitive for different field sizes as long as the entire sensitive detector area is irradiated, but try to keep the field size down to minimize scattering.

Note! It is also recommended to position the Piranha in such a way that the detector area is orientated perpendicular to the anode/cathode axis, to avoid the heel effect.
Recommended field size is 20×40 mm.

3. Connect with Handheld via Bluetooth, or with Ocean via included USB cable or via Bluetooth.

1.4 Standards and Compliances

Hereafter you can find declarations of conformity, as well as documents describing the intended use of the Piranha system.

1.4.1 FCC Certification

Piranhas of product version 3.1 and newer contains FCC certified transmitter module (Bluetooth).

FCC ID R47F2M03GX

This device has been tested and found to comply with the limits for a Class-B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used according with the instruction manual, may cause harmful interference to radio communication. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

1.5 Standards and Compliances

For standards and compliances, see the reference manual.

2 Description of the QABrowser

2.1 Starting the QABrowser

Wireless through Bluetooth

1. Turn on the meter.
2. Launch the QABrowser by tapping on the QABrowser icon.

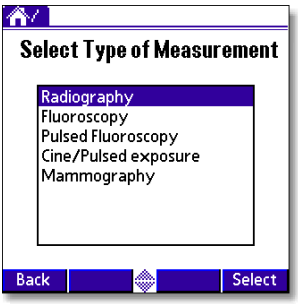
   Please note that **All** needs to be selected at the top of the screen for the QABrowser icon to be visible.

3. The handheld will now search for available Bluetooth devices and show them to you.
4. Select your meter and press OK.
5. If prompted enter the passkey for the meter which is “0000”.

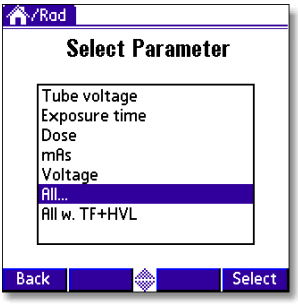
If you experience any problems connecting through Bluetooth please see the troubleshooting chapter in the reference manual, or visit the RTI website for more information.

2.2 Real-time Display and Waveforms

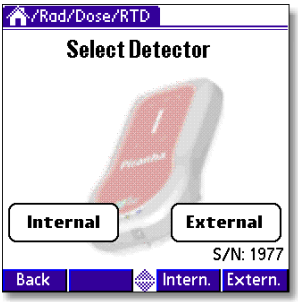
2.2.1 Using the Real-Time Display



1. A list with different type of measurements is shown. Note that the number of items in the list is depending on the configuration of your Piranha system. Your list may have other choices than the list shown here. To view items not visible, tap the arrow or use the scroll button on the handheld computer.
   For this example, select **Radiography**.



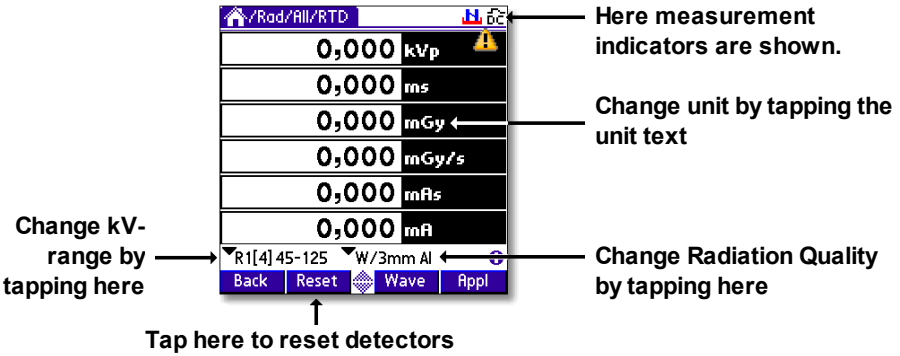
2. A list with all different parameters are shown. You can select to measure a single parameter or all at the same time. In this example select **All**.
   Note that the parameters shown here, are the ones that are available with the current configuration of your system, including attached probes. For instance must your MAS probe be attached for the mAs parameter to be shown.

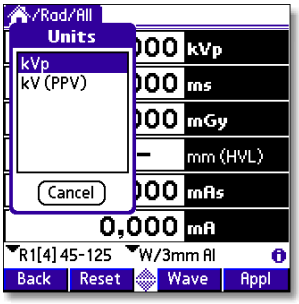


3. If you had chosen Dose earlier, and you have a Piranha model that supports external dose measurements you must select the detector you want to use. If you want to measure dose with the external probe tap **External**, otherwise tap **Internal**.

4. The *Real-Time Display* (RTD) is now shown and you are ready to measure, see figure below. The Piranha is set to the most suitable settings for the selected type of measurement, in this case radiography. The selected kV-range is 45-125 and the radiation quality is W/3mm Al (reference radiation quality). Depending on type of measurement, you may have several kV-ranges and beam qualities to choose from. For radiography, you have three different kV-ranges (35-75, 45-125, and 90-

155) to select between.You will have four displays on this screen if you do not have/use a mAs-probe and six if you selected to measure mAs. The manual for the mAs-probe explains how to connect it.

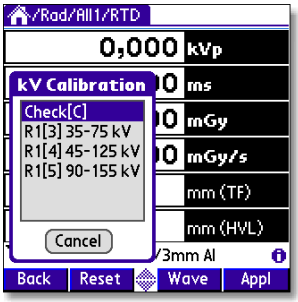




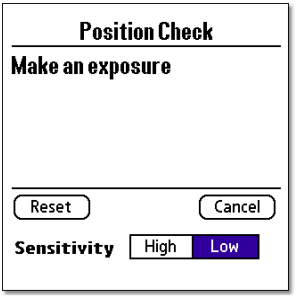
When you tap a unit, a list to select unit from is shown. Tap the desired unit or tap **Cancel** to keep the present one.

The first thing to do before starting to measure, is to verify that the Piranha is placed correctly in the X-ray field. A special function is available to do this. Position the Piranha under the tube as described in the topic Setting Up the Piranha 6.

Note! The *Position Check* is usually not necessary for Radiography, but often essential for the other modalities, in order to get more accurate measurements. To skip go to 8.

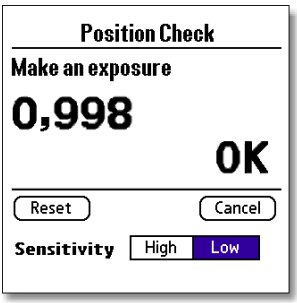


5. Tap the kV-range selector, and a list will appear, as shown left. Tap **Check[C]** to select the Piranha position check.



6. The *Position Check* screen is now shown. Set up the X-ray generator. Recommended kV is:

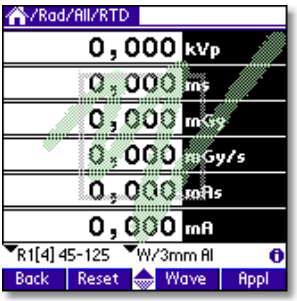
   - Radiography: use 70 kV
   - Mammography: use 28 kV
   - CT: use 120 kV (or any other available kV setting).



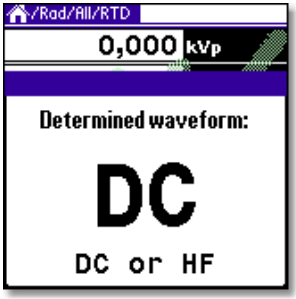
7. Make an exposure. A message will be shown. If the detector is incorrectly aligned, the QABrowser will tell you to re-position the detector. For a small misalignment a correction factor is applied and you are allowed to continue without re-positioning the detector. This message disappears automatically if the position is OK.

If the displayed number is between 0.950 and 1.050 the position is acceptable and a correction factor will be applied to correct the position to "1.000". The correction factor is valid until you perform this check again or until you quit the QABrowser. It is recommended to perform the position check after any repositioning of the detector or after change of target/filter combination when measuring on a mammography unit.

You are now ready to make the first exposure. Set the generator to 80 kV. Make sure that the correct kV range is used, in this case "R1[4] 45-125". When you make the first exposure, the Piranha will evaluate what kind of waveform it is (DC/HF, 3-phase/12p, 3-phase/6p, or 1-phase) and the total filtration. This is done for all measurement types but mammography. Default values are "DC/HF" and 3.0 mm Al.

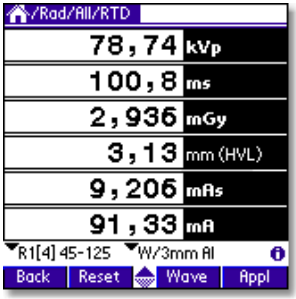


8. Make an exposure. Every time the Piranha recognizes an exposure the RTI logo is superimposed on screen for a short while.



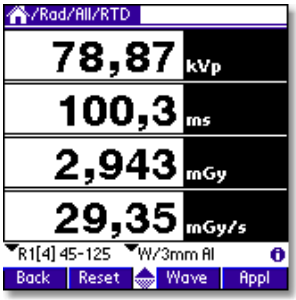
The Piranha analyses the waveform and shows the result automatically after the first exposure. If the result is incorrect the actual waveform type needs to be set manually, see topic Settings 13 for more information.

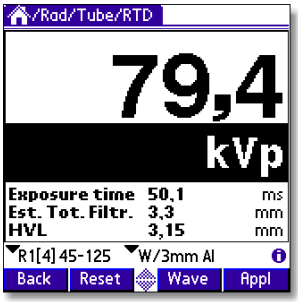
The Piranha measures the total filtration for each exposure (for all measurement types except mammography). It is shown automatically after the first exposure.
If you want the QABrowser to lock this value and not estimate it again for the following exposures, tap **Keep**. You can also enter the total filtration manually under the settings, see topic Settings 13 for more information.



Up to six values can be shown simultaneously. Measured kVp, dose, and dose rate values are compensated depending on actual total filtration (between 1.5 - 38 mm Al) and waveform type.

The display looks different depending on the type of parameter you selected in step #3 and if you are using a mAs probe or not. In the pictures below you can see how the screen looks if you do not measure mAs and if you select just **Tube voltage**.



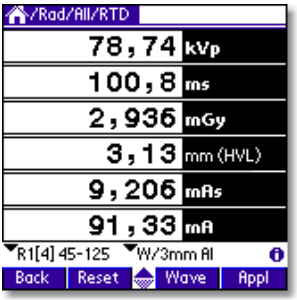


The single parameter displays are large to allow reading from distance. In the single parameter displays complementary values may be shown (in the figure above exposure time and total filtration). Which complementary values that are shown depends on the selected parameter. Up to three complementary values can be shown.

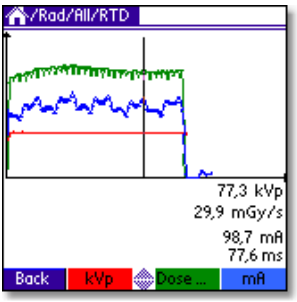
If any of the displayed values is not possible to compensate or cannot be measured with full accuracy the symbol ⚠ is displayed at the top of screen. If the symbol is displayed you can tap it with the pen to display more information.

2.2.2 Waveforms - Acquiring and Viewing

To view waveforms after the exposure:



1. Tap **Wave** (or press the corresponding button). The waveform screen appears and waveforms are displayed. The kV waveform takes a few seconds to calculate before it is displayed.



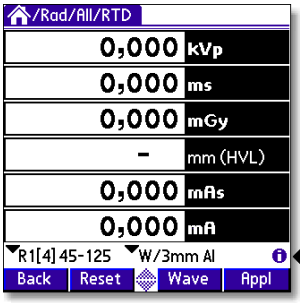
2. The waveforms are displayed and you can use the pen to move the cursor. Corresponding cursor values are shown under the waveforms.

3. Tap **kVp**, **Dose…**, or **mA** once to hide/show the corresponding waveform.

4. You can now make new exposures without returning to the real-time display. The old waveforms are then erased, and the new ones are shown. Note! If the *waveform recording time* is much longer than the exposure time, you may only get a part of the waveform, since the Piranha is still capturing the waveform. Then you can go back to the RTD and tap **Wave** again, when the *waveform recording time* has passed, to get the full waveform.

2.2.3 Measurement Settings

As mentioned before all settings of the Piranha are done automatically when you select type of measurement. For example, when you choose fluoroscopy the detector sensitivity is set to high. However, there might be situations where the default settings cannot be used and settings must be adjusted. Use *Settings* to adjust the Piranha when necessary. The figure below shows how to access this function.

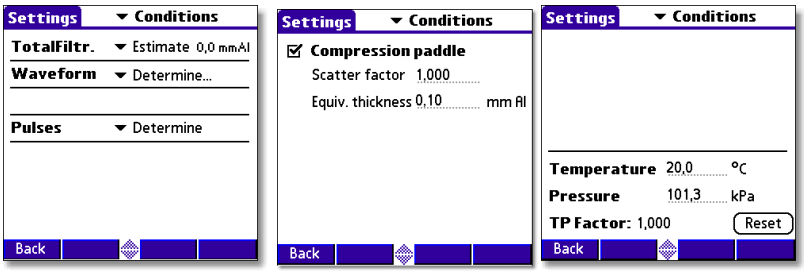


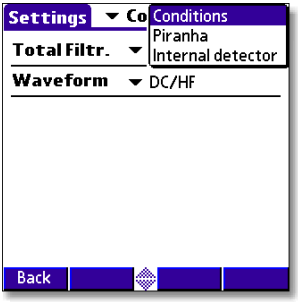
Tap this symbol to open the screen with *Settings* for the Piranha and the various detectors

When you tap the , symbol the *Settings* screen is shown. This can also be accomplished by tapping the icon on the graffiti area (or the Tungsten T3, T5, TX status bar). What is shown here is dependent on selected parameter(s) and used detectors.

Conditions

Shows general conditions for the measurement. Different values can be shown depending on selected measured parameter. Details about the Condition screens can be seen in Settings - Conditions 15.

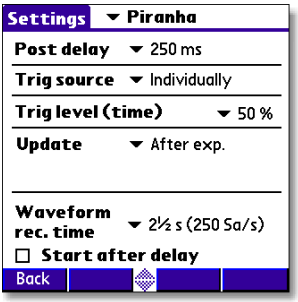




Tap **Conditions** to show the drop-down list with other settings:

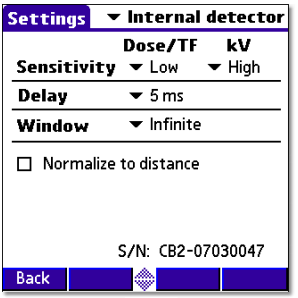
Piranha: General settings for the Piranha.
Internal detector detector: Specific settings for the *Internal detector detector*.

If your model of Piranha has an external probe that is attached it will also show here.



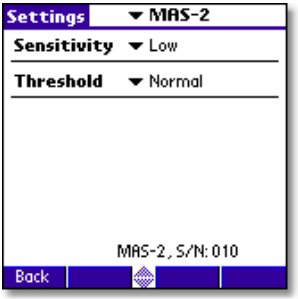
Piranha

Shows general settings for the Piranha. You can find information about the different parameters in Settings - Piranha 18.



Internal detector

Shows specific settings for the Internal detector detector as well as the serial number.
You can find information about the different parameters in Settings - Internal detector 20.



MAS-2

Shows specific settings and the serial number for the detector that is connected to the external connector. In this case it is a MAS-2 probe.

You can find information about the different parameters in Settings - Other Detectors 21.

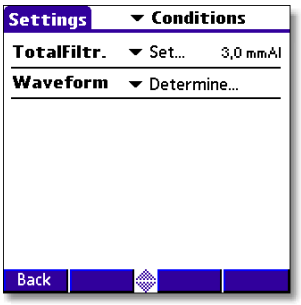
Default values for the settings are depending on the selected type of measurement and detector.

Tap **Back** to return to the real-time display.

2.2.3.1 Settings - Conditions

Here general conditions for the measurements are shown. Different values can be shown depending on selected measured parameter.

Conditions - TF and Waveform



These are parameters of the X-ray generator which influence the measurements. The Piranha can measure these, or you can set them yourself.

Total Filtr. Shows actual total filtration value. *Estimate* means that a new estimation will be performed at next exposure and the values will be displayed on screen.

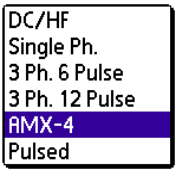
Waveform Shows the actual waveform type. Determine means that a new analyse of the waveform will be performed for the next exposure. The result will be displayed on screen. The waveform types supported are:

- *DC/HF*
- *Single Phase*
- *3-Phase 6-Pulse*
- *3-Phase 12-Pulse*
- *AMX-4*
- *Pulsed*

The first four can be automatically determined when *Estimate* is chosen. The selected or set waveform is also shown with a symbol on the Real-Time Display, see Indicators and Symbols 23.

AMX-4

The difficulties when measuring tube voltage on a GE AMX-4 is a well-known problem. Due to high kV ripple at a frequency of 2 kHz it is hard for most non-invasive kVp-meters to follow the kV waveform correctly.



Therefore it is important to select the **AMX-4** waveform under **Settings | Conditions**.

More about the AMX-4 correction can be found in the Application Note 1-AN-52020-1 from RTI Electronics AB.

Pulsed

This waveform type should be used for pulsed fluoroscopy especially when the pulses do not have a "good" square waveform shape. The exposure time must be longer than the selected recording time when using this waveform type. Pulsed waveform type is selected under **Settings | Conditions** in the same way as the AMX-4 waveform type.

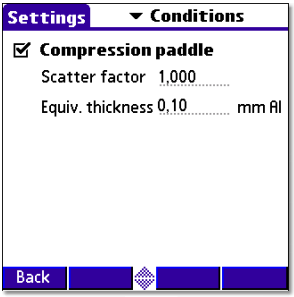
Conditions - Pulse rate

Conditions - Pulse rate

If a pulsed mode is used, like pulsed fluoroscopy or pulsed radiography (cine) the pulse rate can be specified in pulses per second (same as Hz). This allows you to get a dose/pulse reading even if the detector used (e.g. ion chamber) is too slow for the Piranha electrometer to detect the pulses. A solid-state detector, like the Piranha Dose Probe, is however fast enough to detect the frequency even for very low-level signals.

Conditions - Compression paddle

For mammography, it is sometimes easier to do measurements with the compression paddle in the field. The compression paddle will however normally affect the Piranha kV and dose reading. With this check box, all the measured values (kV, dose and HVL) will be corrected according to what the user has selected. The default setting the first time you start the software is without the compression paddle in the field.



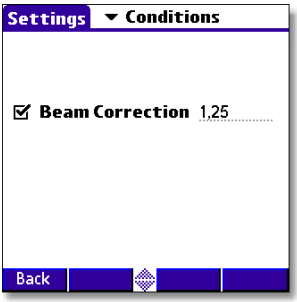
When selected you will see the settings for *Scatter factor* and *Equivalent thickness*. The thickness is given in mm Al, if you do not know, ask the manufacturer or make a comparison with Aluminium filters. When this option is active, an indicator on the RTD screen indicates that this feature is on.

Scatter factor If an ion chamber is positioned just below the compression paddle, the measured dose will rise, because of side scattering from the compression paddle material. The effect of this is depending on the ion chambers angular dependence. Since the Piranha is almost insensitive to this, you can put a number here to compare readings from the Piranha with readings from an ion chamber. See also section Average Glandular Dose, AGD (MGD).
When this is activated a red compression paddle indicator will show in the top right corner of the RTD screen (▬).

Equiv. thickness The given equivalent compression paddle thickness is used to increase the accuracy of dose measurements when dose is measured below the compression paddle. It is given in equivalent thickness of aluminium.

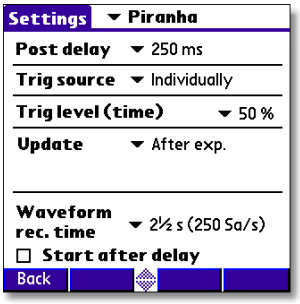
Note! This feature can also be used if you have additional filtration in the beam. Add the equivalent thickness of aluminium.

Conditions - Beam Correction



Sometimes you may want to make comparable measurements with known mechanical setup. For instance if you want to emulate ion chamber measurements in a particular scattering situation. Then you can set a *Beam Correction factor* to get that reading. In this case the ion chamber measures an extra 25 % from side and back-scatter. Using this factor makes the readings to be the same. It is of course important that the mechanical setup in these cases are the same. When this function is activated a red horisontal indicator will show in the top right corner of the RTD screen (—).

2.2.3.2 Settings - Piranha



Here general measurement settings for the Piranha are shown.

Post Delay

The post delay time defines how long time the Piranha shall wait and "look for more" after detecting what can be considered to be "the end of the exposure". Default value is 250 ms. The post-delay is necessary when measuring on units with some kind of pre-pulse or for pulsed exposures.

The post delay can be set to: *Off, 25 ms, 250 ms, 1 s,* or *Other…* (0-9999 ms).
The default value is set according to selected type of measurement, see section Measurement Type Settings in the Reference Manual.

Trig source

This setting makes it possible to define the trig source for the electrometer module.
Available settings are:

- *Individually*, each detector starts to measure individually when it detects a signal.
- *Internal detector*, the measurement of all parameters (all modules) start when the Internal detector starts to measure.

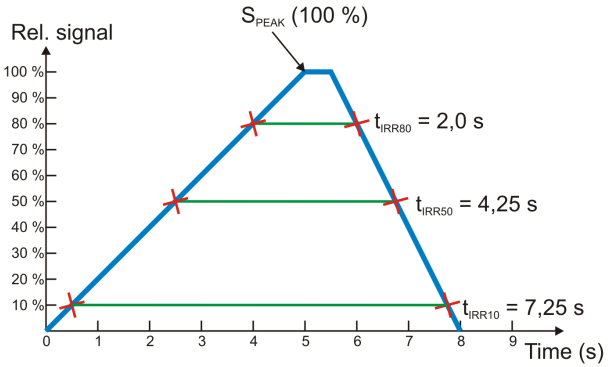
Default value is always Internal detector when it is used. This is the recommended trig source.

Trig level (time)

Here you can set the level used for irradiation time measurements. "Trig level (time)" (TL) is normally set to 50 % of the peak waveform (S_{PEAK}), but can be set between 10 and 90 %. The irradiation time is then calculated as the end time minus the start time.

- The start time is the first time the signal goes above $TL \times S_{PEAK}$.
- The end time is the last time the signal goes below $TL \times S_{PEAK}$.

See example below.



Update

This setting defines when Piranha shall send measured values to the QABrowser.
Four different alternatives are available:

- *After exp*., the QABrowser receives a new value when the exposure terminates.
- *Continuous*, the Piranha is continuously sending data as long as radiation is detected. Displays in the QABrowser are updated about every four seconds. Typically used for Fluoroscopy.
- *Timed*, the user sets a measurement time. The user then starts the measurement and the Piranha will measure all radiation received during the measurement time, without any trig levels. When the time has passed, a reading will be presented.
- *Free run*, the Piranha will continuously measure the radiation without any trig levels.

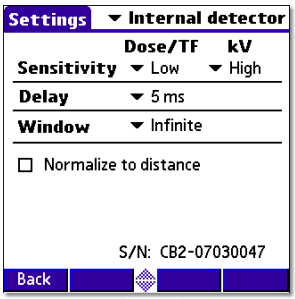
Default value is set according to selected type of measurement and this parameter normally never needs to be manually changed, unless really low-level measurements are to be accomplished. See the sections Measurement Type Settings and Update Modes in the Reference Manual for more information.

Waveform rec. time

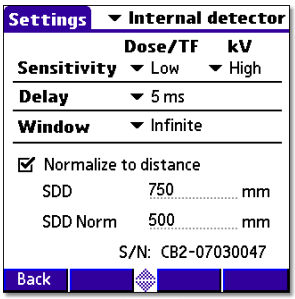
The QABrowser is able to show a total of 640 samples. The sampling interval is normally 0.5 ms, giving a total measurement window of 320 ms. By increasing the sampling interval, a sampling window up to 40 seconds, or even more, can however be selected. This is very handy when longer exposure times are used and the waveforms need to be viewed.
See section Update Modes in the Reference Manual for more information. The default value is set according to selected type of measurement.

Start after delay When this is selected, the waveform recoding will start after the set delay. This can be useful if you want to study a phenomenon that occurs after the normal waveform recording time. When this is selected the electrometer waveform will not show simultaneously and you will get a warning that the irradiation time measurement is inaccurate. The reason for this is that the Piranha needs the waveform from start to be able to accurately calculate the irradiation time.
This is a temporary setting, and it will be turned off when you exit the RTD.

2.2.3.3 Settings - Internal detector



Here general measurement settings for the Internal detector are shown. You can find information about the different parameters below.



If *Normalize to distance* is checked, another section is shown. See description below.

Sensitivity Dose/TF This is used to set the dose and TF sensitivity for the Internal detector.
The sensitivity can be set to: Low, High, and Very High.

Default value is set according to type of measurement.

Sensitivity kV This is used to set the kV sensitivity for the Internal detector.
The sensitivity can be set to: Low and High.

Default value is set according to type of measurement selected.

Delay The delay time defines how long time the Piranha shall wait before starting to measure kVp after that radiation has been detected.

The delay can be set to: Off, 5 ms, 25 ms, 100 ms, 500 ms, 1 s, 2 s, or Other…(0-9999 ms)

The default value is set according to selected type of measurement.

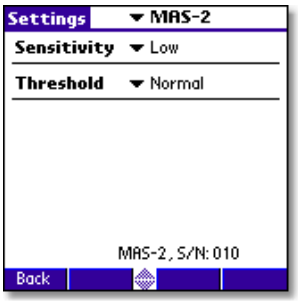
Window This gives the possibility to define a fixed time that Piranha measures kVp after that the delay time has expired.

The window can be set to: Infinite, 5 ms, 10 ms, 25 ms, 100 ms, 200 ms, or Other…(0-9999 ms)

Default value is always "Infinite".

Normalize to distance If Normalize to distance is checked, you have the option to normalize the dose reading to any given distance. Here you can enter your Source to Detector Distance (SDD) and a normalizing distance (SDD Norm), that you want the dose normalized to. When this is activated a blue **N** will show in the top right corner of the RTD screen.

2.2.3.4 Settings - Other Detectors



Here general measurement settings for other detectors or probes are shown. You can also see the detector's serial number. Note that different detectors have different options.

Sensitivity This is used to set the sensitivity for the electrometer module. The sensitivity can be set to: *Low* and *High*.

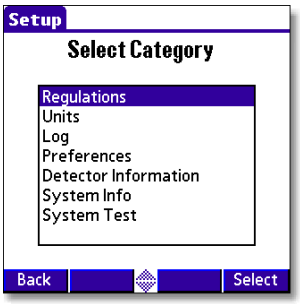
Default value is set according to selected type of measurement and used detector.

Threshold This is used to set the trig level. It can be set to *Low (½×)*, *Normal, 2×*, *4×*, and *8×*. The default value is "Normal". The setting "Low" can be used if low signals are measured and a lower trig level is required. However, the risk for false triggering increases when "Low" is used. To avoid false triggering in a noisy environment use one of the "higher" threshold levels.

Normalize to distance Note: Only for dose detectors!
If *Normalize to distance* is checked, you have the option to normalize the dose reading to any given distance. Here you can enter your

Source to Detector Distance (SDD) and a normalizing distance (SDD Norm), that you want the dose normalized to. When this is activated an "N" symbol will show on the RTD screen.

2.3 QABrowser Setup



The Piranha Setup is used to define different parameters that control the function of the QABrowser and Piranha. Open the QABrowser main menu and select **Setup**. All settings are described in the reference manual.

2.3.1 Units Setup

Units Setup is used to change the preferred unit of measure for dose and dose rate, as well as units for temperature and air pressure. These are then the default units for all new tests.

Tap the unit you want to change and tap the desired unit in the list that pops up.

Note! When measuring in the RTD you can temporarily change a unit by tapping the unit text with the stylus.

2.3.2 Preferences Setup

Sleep time defines how for how long time the handheld computer stays on when it is not used and charging is off.

Stay on in Cradle defines that it should stay on as soon as it is connected to and powered from the Piranha.

Auto prompt is for the built-in applications in multi-parameter mode. It defines how long time the result from one exposure is shown before the cursor moves on to the next position.

Lock unit prefixes means that the prefix of a unit is fixed and not auto-ranging.

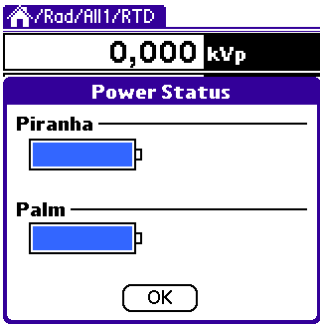
Analyse waveform means that the Piranha automatically analyses and determines the type of waveform.

Indicate trig lets you select how a trig event will be presented to you. Can be all combinations of sound and graphics.

Active messages lets you enable/disable the use of active messages (the QABrowser automatically changes range or filter when the signal or tube voltage is too low/high).

2.4 Battery & Power Status

The battery status for the Piranha and handheld are displayed together on a informative display, as shown below. You access this screen on the menu (tap the icon) by selecting *Info - Power Status*.



Battery Level
For both the Piranha and the Palm you can monitor the charge level by the fill of the battery symbol.

See also Indicators and Connectors 4.

2.5 Indicators and Symbols

These indicators are shown in the upper rightmost corner of the real-time display (RTD) and application screens. These are either attention messages, settings affecting your measurement readings, or settings you have made. Especially when using favourites they will give you a quicker overview. A surrounding square indicates the relative position of the three first, as they may be shown simultaneously.

This symbol indicates that the function Beam Correction is active. The set beam correction factor can be changed under Settings 13.

This symbol indicates that the function normalize to distance is active. The set distances can be changed under Settings 13.

For mammography. This symbol indicates that a compression paddle is used in the beam. The doses measured by the Internal detector detector can then be compensated to simulate the scatter effect, that an ion chamber shows when a compression paddle is positioned directly above the detector. The equivalent thickness and scatter factor can be changed under Settings 13.

Waveform indication. This symbol indicates that the waveform was set or determined as DC/HF. Tube voltage readings are affected by this. The waveform functionality can be changed under Settings 13.

Waveform indication. This symbol indicates that the waveform was set or determined as single phase. Tube voltage readings are affected by this. The waveform functionality can be changed under Settings 13.

Waveform indication. This symbol indicates that the waveform was set or determined as 3-Phase 6-Pulse. Tube voltage readings are affected by this. The waveform functionality can be changed under Settings 13.

Waveform indication. This symbol indicates that the waveform was set or determined as 3-Phase 12-Pulse. Tube voltage readings are affected by this. The waveform functionality can be changed under Settings 13.

Waveform indication. This symbol indicates that the waveform was set as AMX-4, from General Electric. See Settings - Conditions 15 for more information. Tube voltage readings are affected by this. The set waveform can be changed under Settings 13.

This symbol indicates that one or more measured value is not displayed with maximum accuracy. This indicator is for example shown when the Piranha is unable to apply a correction/compensation to a measured value. Tap the symbol to get a detailed description of the problem.

The indicators may appear in different situations and in different places in the QABrowser but they always have the same meaning and functionality.

3 Problems and Solutions

3.1 Troubleshooting

Before contacting your distributor or RTI Electronics, please check the following tips.

A. Check the RTI web page for updates http://www.rti.se.

B. Run through the checklist below.

The Piranha does not work
Check:
1. Check that the motor moves properly or can beep. (QABrowser: **Setup | System Test**).

The Piranha filter seem to have stuck
1. Start the QABrowser and run the filter test. (QABrowser: **Setup | System Test**)
2. Hold the Piranha in you right hand by the cable edge.

3. When the motor is trying to move, tap the Piranha's left long edge in the palm of your left hand until it comes free.

The electrometer does not give a reading
Check:
1. That the correct input connector is used and connected.
2. That probe cables look healthy.

The electrometer gives numerous trig indications
If you get the trig indicator ("play" symbol) when there is no signal:
1. Press reset.
2. If it comes over and over you may need to increase the trig level, by raising the threshold, see topic Settings 13.

The electrometer or Piranha gives too low dose rate
If you get to low dose rate readings or too short irradiation times for short exposures:
1. Check that you are measuring with a good geometry, where the incoming radiation is perpendicular to the detector surface. See Specifications, Piranha for details.

The QABrowser does not show the Bluetooth "Discovery Results" screen
Try the following:
1. Exit the QABrowser.
2. Do a hardware reset of your Tungsten (using the reset hole on the back of the Palmtop).
3. Restart the QABrowser.

Installation or upgrade of RTI Updater failed
Make sure you are not having a restricted user account (on Windows XP, 2000, or newer). You will need to have access to an administrative account to install the software, see section Windows Restricted User Accounts for details.

My Piranha cycles its status indicator quickly between colours and does not measure
Your system is in Bootloader mode. Please run RTI Updater to correct this.

My Piranha beeps twice quickly when starting
The Piranha normally beeps once when starting. If it beeps twice quickly when powering on, run RTI Updater to correct this.

I get a blank white screen when running the QABrowser
Click the Back button (leftmost) to get out and then re-enter the test again.

Bluetooth unable to reconnect using Retry
Tap **Exit** and restart the Piranha and then re-start the QABrowser again.

Bluetooth only shows "Unknown device" when trying to connect
Depending on Palm model it may take a little while for the serial number to appear, the Piranha will appear as "Unknown device". Normally it will show the serial number if you wait a while.

How do I change from Gray to Röntgen units?
You can set this for all tests (**pull-down menu | Setup | Units**), see Units Setup 22. It is also possible to set mixed units for a test and save as Favourites. All measurements settings, QABrowser settings, set values, and selected units will be saved with the Favourite.

How do I stop the units from autoscaling its prefixes?
There is a preference setting for this (**pull-down menu | Setup | Preferences**), see Preferences Setup 22.

Can I set the time before the Handheld powers off automatically?
Yes, there is a preference setting for this (**pull-down menu | Setup | Preferences**), see Preferences Setup 22.

How do I reset the Handheld computer?
There is a small reset hole on the back of the Handheld computer, use the stylus (pointer) to reset.

Please see the Piranha Reference Manual for more Troubleshooting tips.

C. Contact your local representative or RTI Electronics AB. The more information you supply will help us to get a quick solution to your problem. Examples of useful information is screen dump pictures, exact error message texts, log files, etc. You may also use the auto-report function described in the section How To Report a Problem in the Piranha Reference Manual.

Index

Note!
Page references in this Index points to the first page of the section it is mentioned, not the exact page.

- A -
Active messages 22
Additional filtration (mammo) 16
After exposure update mode 18
AMX-4 15
Analyse waveform 22
Auto prompt 22
Auto-power off 24
Autoscaling 24

- B -
Battery
  charging 23
  indicator 23
  level 4, 23
  running time 4
  status 4, 23
  warning 23
Battery charging indicator 4
Beam Correction 23
Beam correction factor 17
Beam quality 8
Blank screen 24
Bluetooth 7, 24
  Indicator 3

- C -
Camera thread 3
CAS-6 6
CAS-7 6
Change
  Unit of measure 8
Charging Batteries 23
Checking battery status 23
Compliances 7
Compression paddle 16
  Equivalent thickness 13
Compression paddle indicator 23
Conditions 13, 15
Connector
  External probe 3
  Palm charging 3
  USB 3
Connectors 3
Continuous update mode 18
Current waveform 12

- D -
Default Unit 24
Delay 20, 21
  Start efter 18
  Waveform 18
Demo 7
Detector 8
Detector settings 21
Detector surface 3
Dose Probe 3
Dose Sensitivity 20

- E -
Electrometer waveform 12
Equivalent thickness
  Compression paddle 13
Error 24
Exclamation indicator 24
External probe connector 3

- F -
FCC 7
Filtration Additional(mammo) 16
Free run update mode 18

- H -
Handheld Reset 24
Heel effect 6
Holder
  Piranha 6
HotSync 24
HVL
  Stand 6

- I -
Indicate trig 22
Indicator
  Battery charging 3
  Bluetooth 3
  Status 3
Indicators
  Battery level 23
  Beam Correction 23
  Compression paddle 23
  Exclamation indicator 24
  Measurement 8
  Normalize 23
  RTD 8
  Warning 24
  Waveform indicator 24
Internal detector settings 13, 20

- K -
kV Sensitivity 20
kVp waveform 12

- L -
Lock unit prefixes 22
Low battery warning 23

- M -
Module 8

- N -
Normalization distance 13
Normalize indicator 23

- P -
Piranha 6
  Cable 6

Piranha 6
Holder 6
Piranha position check 8
Piranha settings 13, 18
Position check
of Piranha 8
Post delay 18
Power Management 23
Power supply 23
Power switch 3
PPV 8
PPV waveform 12
Practical Peak Voltage 8
Preferences 22
Prefixes
Lock 22
Prefixes, Unit 24
Problem report 24
Pulse rate 16

- Q -

QABrowser
Setup 22

- R -

Radiation quality 8
Real-Time Display 8
Reset
Bluetooth 24
Handheld 24
Piranha 8
Retry 7
Röntgen Unit 24
RTD 8
Indicators 8
Running time 4

- S -

Safety strap 3
Scatter factor 13
SDD
Normalization 13
Select
Beam quality 8
Detector 8
Module 8
Unit of measure 8
Sensitivity 20, 21
Dose/TF 20
kV 20
Serial number 8
Settings 20, 21
Beam correction factor 17
Compression paddle 16
Conditions 13, 15
Delay 20, 21
Detector 21
Internal detector 13, 20
Piranha 13, 18
Post delay 18
Pulse rate 16
Sensitivity 20, 21
Threshold 20, 21
Total Filtration 15
Trig level (time) 18
Trig source 18
Update mode 18
Waveform recording time 18
Waveform type 15
Window 20, 21
Setup
Power Management 23
Preferences 22
QABrowser 22
Units 22
Sleep time 22
Stand 6
Standards and Compliances 7
Start after delay 18
Starting the QABrowser 7
Status indicator 3
Stay on in Cradle 22
Support 24
Symbols 23

- T -

TF Sensitivity 20
Threshold 20, 21
Timed update mode 18
Total Filtration 15
Trig
Visual indication 22
Trig level (time) 18
Trig source 18
Troubleshooting 24

- U -

Unit
Default 24
Gray 24
Prefixes 24
Röntgen 24
Unit of measure
Change 8
Units 22, 24
Unknown device 24
Update mode 18
USB connector 3

- W -

Warning indicator 24
Waveform
Activating 22
Waveform delay 18
Waveform indicator 8, 24
Waveform recording time 18
Waveform type 15
Waveforms 12
White screen 24
Window 20, 21